

WHAT IS CLAIMED IS:

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1. A semiconductor device comprising:

a gate electrode formed on an insulating surface;
a gate insulating film on said gate electrode; and
a source region, a drain region, and a channel formation region formed between said source region and said drain region, the respective regions being in contact with said gate insulating film;

wherein said gate insulating film includes a layer of a silicon nitride oxide film containing boron.

2. A device according to claim 1, wherein a composition ratio of boron in said silicon nitride oxide film is 0.1 to 50 atoms%.

3. A device according to claim 1, wherein a composition ratio of oxygen in said silicon nitride oxide film is 1 to 30 atoms%.

4. A device according to claim 1, wherein said semiconductor device is one selected from the group consisting of an electro-optical device and an electronic equipment.

5. A device according to claim 4, wherein said electro-optical device is one selected from the group consisting of a liquid crystal display device, an EL display device, an EC display device, and an image sensor.

6. A device according to claim 4, wherein said electronic equipment is one selected from the group consisting of a video camera, a digital camera, a projector, a goggle display, a car navigation system, a personal computer, and a portable

information terminal.

7. A semiconductor device comprising:

a source region, a drain region, and a channel formation region formed between said source region and said drain region, the respective regions being in contact with an insulating surface;

a gate insulating film on said channel formation region; and

a gate electrode to be in contact with said gate insulating film;

wherein said gate insulating film includes a layer of a silicon nitride oxide film containing boron.

8. A device according to claim 7, wherein a composition ratio of boron in said silicon nitride oxide film is 0.1 to 50 atoms%.

9. A device according to claim 7, wherein a composition ratio of oxygen in said silicon nitride oxide film is 1 to 30 atoms%.

10. A device according to claim 7, wherein said semiconductor device is one selected from the group consisting of an electro-optical device and an electronic equipment.

11. A device according to claim 10, wherein said electro-optical device is one selected from the group consisting of a liquid crystal display device, an EL display device, an EC display device, and an image sensor.

12. A device according to claim 10, wherein said electronic

equipment is one selected from the group consisting of a video camera, a digital camera, a projector, a goggle display, a car navigation system, a personal computer, and a portable information terminal.

13. A semiconductor device comprising:

an insulating film formed on an insulating surface; and
a semiconductor component formed on said insulating film;

wherein said insulating film is a silicon nitride oxide film containing boron.

Sub 14. A device according to claim 13, wherein a composition ratio of boron in said silicon nitride oxide film is 0.1 to 50 atoms%.

15. A device according to claim 13, wherein a composition ratio of oxygen in said silicon nitride oxide film is 1 to 30 atoms%.

16. A device according to claim 13, wherein said semiconductor device is one selected from the group consisting of an electro-optical device and an electronic equipment.

17. A device according to claim 16, wherein said electro-optical device is one selected from the group consisting of a liquid crystal display device, an EL display device, an EC display device, and an image sensor.

18. A device according to claim 16, wherein said electronic equipment is one selected from the group consisting of a video

camera, a digital camera, a projector, a goggle display, a car navigation system, a personal computer, and a portable information terminal.

19. A semiconductor device comprising:

a semiconductor component formed on an insulating surface; and

an insulating film for protecting said semiconductor component;

wherein said insulating film is a silicon nitride oxide film containing boron.

20. A device according to claim 19, wherein a composition ratio of boron in said silicon nitride oxide film is 0.1 to 50 atoms%.

21. A device according to claim 19, wherein a composition ratio of oxygen in said silicon nitride oxide film is 1 to 30 atoms%.

22. A device according to claim 19, wherein said semiconductor device is one selected from the group consisting of an electro-optical device and an electronic equipment.

23. A device according to claim 22, wherein said electro-optical device is one selected from the group consisting of a liquid crystal display device, an EL display device, an EC display device, and an image sensor.

24. A device according to claim 22, wherein said electronic equipment is one selected from the group consisting of a video

camera, a digital camera, a projector, a goggle display, a car navigation system, a personal computer, and a portable information terminal.

25. A method of fabricating a semiconductor device, comprising the step of:

forming a silicon nitride oxide film by carrying out sputtering with a semiconductor target added with boron in an atmosphere containing a nitric oxide gas.

26. A method according to claim 25, wherein said nitric oxide gas is one kind or plural kinds of gases selected from the group consisting of a nitrogen monoxide gas, a dinitrogen oxide gas, a nitrogen dioxide gas, and a nitrogen trioxide gas, or a gas obtained by diluting the gas with an inert gas or an oxygen gas.

27. A method of fabricating a semiconductor device, comprising the step of:

forming a silicon nitride oxide film containing boron by carrying out sputtering with a semiconductor target in an atmosphere including a gas containing boron and a nitric oxide gas.

28. A method according to claim 27, wherein said nitric oxide gas is one kind or plural kinds of gases selected from the group consisting of a nitrogen monoxide gas, a dinitrogen oxide gas, a nitrogen dioxide gas, and a nitrogen trioxide gas, or a gas obtained by diluting the gas with an inert gas or an oxygen gas.

29. A method according to claim 27, wherein sputtering is carried out by continuously or stepwisely changing a content ratio of boron in the atmosphere.

30. A method of fabricating a semiconductor device, comprising the steps of:

forming a gate electrode on an insulating surface;

forming a gate insulating film made of a silicon nitride oxide film containing boron on said gate electrode; and

forming a semiconductor thin film on said gate insulating film.

31. A method of fabricating a semiconductor device, comprising the steps of:

forming a semiconductor thin film on an insulating surface;

forming a gate insulating film made of a silicon nitride oxide film containing boron on said semiconductor thin film; and

forming a gate electrode on said gate insulating film.